REMARKS

In the last Office Action, claims 1-5, 7-9, 11-18 and 28 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,229,609 to Muramatsu et al. ("Muramatsu"). The Examiner stated that Muramatsu discloses an information recording apparatus comprising all features of the claimed invention, including a probe 4 for producing or scattering near field light for reading or recording information, probe access means for causing a tip of the probe to access a desired region of a recording medium where the information is to be read or recorded, probe scanning means 39, 40 for scanning the tip of the probe across a surface of the recording medium, and heat radiating means 33 for radiating heat through the tip of the probe, wherein the surface of the recording medium 37 is provided with a thin film that varies in physical properties in response to heating of the surface by the tip of the probe in the vicinity of the produced or scattered near field light to heat the desired region of the recording medium to record information on the recording medium.

Claims 6, 10, 19-27 and 29-31 were rejected under 35 U.S.C. §103(a) as being unpatentable over Muramatsu in view of U.S. Patent No. 6,101,164 to Kado et al. ("Kado") and U.S. Patent No. 6,535,474 to Yee et al. ("Yee"). Yee was cited as

disclosing that the surface of the recording medium is formed of a material which has a physical property that varies in response to the application of thermal energy thereto as recited in claims 19 and 20, and heat generating means for sufficiently heating to change the physical property of a desired region of the recording medium, as recited in claims 6, 10 and 27. Kado was cited as disclosing other features of the claimed recording medium.

Applicants respectfully submit that claims 1-31 patentably distinguish over the prior art of record.

A magneto-optical recording device retrieves information stored on a recording medium by detecting the light polarization state of a reflected or transmitted portion of light emanating from the recording medium. In such a device, the reflected or transmitted light must be passed to a photodetector, which results in a substantial loss of light.

Since near-field light has an inherently low intensity, it would be difficult to employ a conventional magneto-optical recording scheme in an optical memory which utilizes near-field light for the recording and/or reading of data.

The present invention overcomes the foregoing problem by performing local heating of a desired region of a recording medium by or in addition to the use of near-field

light. In accordance with one aspect of the present invention recited by independent device claims 1, 9 and 20, the inventive information recording apparatus comprises a probe for producing or scattering near-field light and heat radiating means for radiating heat through the tip of the probe to record information on a recording medium. The surface of the recording medium has a thin film that varies in physical properties in response to heating of the surface by the tip of the probe.

More specifically, in accordance with the present invention, the surface of the recording medium or the probe is illuminated to produce near-field light. A sharpened tip of the probe is brought into close proximity to the recording medium surface and information is recorded onto the recording medium by locally intensified energy caused by insertion of the probe tip in a region of the near-field light.

Because near-field light is produced on the surface of the recording medium by illuminating the surface of the recording medium, high density recording of information can be achieved without the transmission of light through the recording medium, i.e., even onto an opaque recording medium.

In accordance with another aspect of the present invention, the recording medium is illuminated with light to produce the near-field light. The illuminating light is

insufficient by itself to vary the properties of the thin film surface of the recording medium. However, when the probe tip is brought into close proximity to the recording medium, local heating occurs to vary the properties of the thin film and write data to the recording medium.

In the embodiment illustrated in Figs. 10 and 11 of the application drawings, for example, a tip of a probe 26 is inserted in a region of near-field light localized on the surface of a recording medium 3 and caused to access a desired point on the recording medium 3. This causes the near-field light 29 to scatter at the tip of the recording probe 26, producing scattered light (propagation light) having an intensity distribution greater in a vicinity of the tip of the recording probe 26. Due to this, an intensified energy region 30 is caused to overlap with the energy given off by the localized near-field light 29 at the desired point on the recording medium 3 accessed by the tip of the recording probe 26. The intensified energy region 30 causes the phase change film of the recording medium 3 to reach a phase shift temperature at the desired point, which could not be attained by only the energy of the near-field light. Thus, high density information recording is made possible on the recording medium 3.

Accordingly, the present invention relates to an information recording apparatus having a near-field probe which causes local heating of a recording medium for the purpose of recording data. Sufficient heat is produced by radiating heat through the tip of the probe or by using the probe to cause scattering of light with a sufficient intensity to cause local heating.

No corresponding structure or method is disclosed or suggested by the prior art of record.

Muramatsu discloses a scanning near-field microscope that is capable of only observing a sample. Muramatsu does not disclose or suggest the use of local heating of a sample by the probe to record information on the sample. Applicants respectfully submit that the Examiner has misconstrued Muramatsu by citing reference numeral 33 as being heat radiating means. Element 33 in Muramatsu is means for receiving a laser light 30 and does not radiate heat onto a recording medium as required by the rejected independent claims.

A finding of anticipation requires the disclosure, by a single reference, of all claimed subject matter. In the absence of any disclosure by Muramatsu of heat radiating means or the use of a near-field probe for scattering near-field light in the vicinity of the surface of a recording medium to

cause local heating for recording information, as required by independent claims 1, 7, 9, 11, 20 and 28, anticipation cannot be found. See, e.g., Scripps Clinic & Research Foundation v. Genentech Inc., 18 USPQ2d 1001, 1010 (Fed. Cir. 1991) ("Invalidity for anticipation requires that all of the elements and limitations of the claim are found within a single prior art reference ... There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention"); and W.L. Gore & Associates v. Garlock, Inc., 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984) ("Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration").

Muramatsu fails to disclose local heating produced by heat radiating means or the scattering of near-field light as required by the independent claims. More specifically, Muramatsu fails to disclose or suggest the use of heat produced by or separately from a near-field probe as required by independent claims 1, 7, 9, 1, 20 and 28.

Neither Kado nor Yee cures the foregoing defect.

Kado discloses a magneto-optical recording and playback device utilizing phase change technology. However, Kado discloses the use of a conductive probe 4 and fails to

disclose or suggest a near-field probe as required by the independent claims. More specifically, Kado fails to disclose or suggest the use of near-field light or the use of a probe which produces or scatters near-field light as required by independent device claims 1, 9 and 20, or an illumination light source for producing near-field light above the surface of a recording medium as required by independent device claim 7, or a method for recording information in which near-field light is produced or scattered near the surface of a recording medium as required by independent method claims 9, 11 and 28.

Yee is not citable as prior art against any claims of the captioned application. This application is a U.S. national stage application of PCT International Application Ser. No. PCT/JP99/00572, filed February 10, 1999, and claiming a priority date of February 10, 1998. Yee has a U.S. filing date of April 13, 2000 and a priority date of April 15, 1999, which is two months after the priority date of the PCT international application filing date, which, under 35 U.S.C. §363, is the filing date of the present application. The International Bureau communicated the international application to the USPTO on August 19, 1999, as indicated on Form PCT/IB/308 a copy of which was filed with the present application and listed on the transmittal letter. See MPEP §1828.

Accordingly, Yee is not prior art relative to any of the claims of the captioned application and all rejections based on Yee are believed to be in error.

Thus, applicants respectfully submit that the prior art rejections of claims 1-31 are in error and should be withdrawn.

In view of the foregoing amendments and discussion, the application is now believed to be in condition for allowance. Accordingly favorable reconsideration and allowance of the claims are most respectfully requested.

Respectfully submitted,

ADAMS & WILKS
Attorneys for Applicants

By: _____
Bruce L. Adams
Reg. No. 25,386

50 Broadway - 31st Floor
New York, NY 10004
(212) 809-3700

MAILING CERTIFICATE

I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail in an envelope addressed to: MS NON-FEE AMENDMENT, COMMISSIONER FOR PATENTS, P.O. Box 1450, Alexandria, VA 22313-1450, on the date indicated below.

Paul Hoffman
Name

_____
Signature

April 28, 2004